Homework Assignment 1

Assigned Tuesday September 28; due Thursday October 14, 3PM, in class

Required email. The class photo will be on the class' web site in a day or two and you are all required to find it, find yourself in the photo, and send me an email message (either using the feedback form on the class' web site or using my regular email address) with the following information:

- Where are you in the picture? (Say something like "back row 3rd from the left", and to be sure, add something descriptive like "I'm the one with the knotted hair and the Möbius band tattoo on my forehead".)
- Your name.
- Your email address.
- Your telephone number (optional).
- Which of the last four pieces of information do you allow me to put on the web? If you don't write anything about this, I'll assume that your location in the photo, your name and your email address are public but that your phone number is to be kept confidential.

Your email is due earlier than the rest of this assignment, on Monday October 4 at 4PM. If you aren't in the picture at all, find me before Monday and I'll take a (small) picture of you on the spot and edit it into the main picture.

Required reading. Read, reread and rereread your notes to this point, and make sure that you really, really really, really really really understand everything in them. Do the same every week! Also, read all of Munkres chapter 2.

Solve the following problems. (But submit only the underlined ones). In Munkres' book (Topology, 2nd edition), problems 4, $\underline{8}$ on pages 83–84, problems $\underline{4}$, 8 on page 92, problems 6, 7, $\underline{13}$ on page 101, problems 9, 11, 12, $\underline{13}$ on page 112, problems $\underline{6}$, 7 on page 118 and problems $\underline{3}$, 8 on pages 126–128. Also solve (but don't submit) the following

Problem. Let C be the "Cantor set", the closure of the set of real numbers in $[0,1]$ whose expansion to base 3 doesn't contain the digit 1 (e.g., $\frac{3}{4} = 0.2020202020202\ldots$ is in, but $\frac{1}{2} = 0.11111111\ldots$ is out). Prove that C (taken with the topology induced from $\mathbb{R}$) is homeomorphic to $\{0,1\}^{\mathbb{N}}$ (taken with the product topology).